

Having thus described the invention, it is claimed:

1. A solvent-resin composition having generally zero volatile organic compounds (VOCs), the composition consisting essentially of a resin component and a solvent component, the solvent component being 5-95% by total volume of the solvent-resin composition, the solvent component being one or more of the zero-VOC solvents selected from the group consisting of:

10 selected from the group consisting of:

1) chlorobromomethane;

2) 1-bromopropane;

3) methyl acetate;

4) n-alkane (C12-C18);

5) t-butyl acetate;

6) perchloroethylene

1) benzotrifluoride;

parachlorobenzotri

10) 1.0 ml. 1.1

dimethoxyethane

13) 1 1 1 3 3 3 3 6

methoxy-butane;

1,1,1,2,3,3,3-heptafluoropropane;

15) 2-(*o*-t-butyl difluoromethyl)-

1,1,1,2,3,3,3-heptafluoropropane;

177) technical white oils (mineral oils)

2. The composition according to claim 1 wherein the solvent component is present in the amount 40-95% by total volume of the composition.

(3) 3. The composition according to claim 2 for use as an adhesive wherein the solvent component is present in the amount 30%-80% by total volume of the composition.

(4) 4. The composition according to claim 2 for use as an ink wherein the solvent component is present in the amount 70%-95% by total volume of the composition.

Sub A 2
5 15. The composition according to claim 1 wherein the solvent component is present in the amount 10-90%, by total volume of the composition, and a portion of the solvent component is selected from the group consisting of:

10 chlorobromomethane;
1-bromopropane;
methyl acetate;
n-alkane (C₁₂-C₁₈);
t-butyl acetate;
perchloroethylene;
benzotrifluoride;
parachlorobenzotrifluoride;
acetone;
15 1,2-dichloro-1,1,2-trifluoroethane;
dimethoxymethane; and/or
methylene chloride.

6. The composition according to claim 1 wherein the resin component includes methyl acetate, wherein the solvent component is present in the amount 10-95% by total volume, and wherein at least a portion of the solvent component is selected from the group consisting of:

5 chlorobromomethane;
1-bromopropane;
n-alkane (C₁₂-C₁₈);
t-butyl acetate;
10 perchloroethylene;

benzotrifluoride;
parachlorobenzotrifluoride;
acetone;
1,2-dichloro-1,1,2-trifluoroethane;
dimethoxymethane;
1,1,1,2,2,3,3,4,4-nonafluoro-4-methoxy-

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butane;

2-(difluoromethoxymethyl)-1,1,1,2,3,3,3-heptafluoropropane;

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1 - ethoxy - 1 , 1 , 2 , 2 , 3 , 3 , 4 , 4 , 4 - nonafluorobutane; and,

2-(ethoxydifluoromethyl)-1,1,1,2,3,3,3-heptafluoropropane.

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7. The composition according to claim 1 wherein at least a portion of the solvent component, expressed in terms of % by total volume of the at least a portion of the solvent component, is selected from the group consisting of:

(1) 10-90% benzotrifluoride and 10-90% of one or more of the solvents:

(a) 1,1,1,2,2,3,3,4,4-nonafluoro-4-methoxybutane;

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(b) ~~2-(difluoromethoxymethyl)-1,1,1,2,3,3,3-~~
~~heptafluoropropane;~~

(c) ~~1 - ethoxy - 1 , 1 , 2 , 2 , 3 , 3 , 4 , 4 , 4 -~~
~~nonafluorobutane;~~

(d) 2-(ethoxydifluoromethyl)-1,1,1,2,3,3,3-heptafluoropropane;

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(e) perchloroethylene;

(f) 1-bromopropane:

(g) acetone:

(h) n-alkane (C12-C16) :

20

(i) t-butyl acetate (C₁₂-C₁₆) : and.

(i) parachlorobenzotrifluoride:

(2) 5-20% benzotrifluoride and 80-95% 1-bromopropane;

(3) 10-90% acetone and 10-90% n-alkane (C12-C18);

25 (4) 10-90% 1-bromopropane and 10-90% of one or more of:

(a) chlorobromomethane; and,

(b) n-alkane (C12-C18);

30 (5) 10-90% parachlorobenzotrifluoride and 10-90% of one or more of:

(a) 1-bromopropane;

(b) chlorobromomethane;

(c) t-butyl acetate; and,

(d) n-alkane (C12-C18);

35 (6) 10-90% 1,2-dichloro-1,1,1-trifluoroethane and 10-90% of one or more of:

1,1,1,2,2,3,3,4,4-nonafluoro-4-methoxy-butane;

2-(difluoromethoxymethyl)-1,1,1,2,3,3,3-heptafluoropropane;

40 1-ethoxy-1,1,2,2,3,3,4,4,4-nonafluorobutane;

and,

2-(ethoxydifluoromethyl)-1,1,1,2,3,3,3-heptafluoropropane;

1-bromopropane

45 acetone;

benzotrifluoride; and;

methyl acetate.

⑧ 8. The composition according to claim 1 wherein the solvent component consists essentially of 10-90% methylene chloride and 10-90% of one or more of the solvents selected from the group consisting of:

5 chlorobromomethane;

1-bromopropane;

methyl acetate;

n-alkane (C12-C18);

t-butyl acetate;

10 perchloroethylene;
benzotrifluoride;
parachlorobenzotrifluoride;
acetone;
1,2-dichloro-1,1,2-trifluoroethane; and,
15 dimethoxymethane.

Subj 3 9. The composition according to claim 1 for use as an adhesive wherein the solvent component is 40-90% by total volume of the composition of 1-bromopropane.

Subj 9 10. The composition according to claim 1 for use as a blowing agent wherein the solvent component consists essentially of:

5 99-99.98%, by total volume of the solvent component, 1,2-dichloro-1,1,1-trifluoroethane and

0.01-0.5%, by total volume of the solvent component, alpha-methyl styrene to inhibit polymerization.

Subj A 11. The composition according to claim 1 further consisting essentially of approximately 40-95%, by total volume of the composition, 1-bromopropane, and approximately 5-60% of one or more of resins selected from the group of acrylic, epoxy, urethane, nitrocellulose, styrene, polyvinyl chloride and polychloroprene.

Subj 4 12. The composition according to claim 11 further consisting essentially of approximately 70-95%, by total volume of the composition, 1-bromopropane, and approximately 5-30% of one or more of resins selected from the group of acrylic, epoxy, urethane, nitrocellulose, styrene, polyvinyl chloride and polychloroprene.

13. The composition according to claim 1 further consisting essentially of approximately 50-90%, by volume,

1-bromopropane, and 10-30% of one or more of resins selected from the group of acrylic polymer and urethane polymer

14. The composition according to claim 1 further consisting essentially of approximately 45-85%, by volume, of 1-bromopropane, and 10-30% of acrylic polymer or urethane polymer, and 5-10%, by volume, acetone to improve 5 solubility if necessary.

15. The composition according to claim 1 further consisting essentially of approximately 40-90%, by total volume of the composition, of 1-bromopropane, approximately 5-35% of a hydrocarbon resin, and 5 approximately 5-25% of a resin, at least a portion of the resin being selected from the group of styrene-butadiene, polychloroprene, polyvinyl chloride, acrylic, epoxy, urethane, nitrocellulose, or styrene.

sub B2 16. The composition according to claim 1 wherein the a portion of the hydrocarbon resin is selected from the group of olefin, rosin ester and terpene.

sub A5 17. The composition according to claim 1 further consisting essentially of approximately: 5 70-90%, by volume, 1,2-dichloro-1,1,1-trifluoroethane; 9-29% dimethoxymethane; and, 0.5% butylene oxide and 0.5% nitromethane to stabilize the composition.

16 18. The composition according to claim *17* wherein approximately 5-10% by volume acetone is added to the composition to improve solubility as necessary.

(1) 17

18. The composition according to claim 1 wherein the solvent component, expressed in terms of % by total volume of the composition, consists essentially of 1-20% technical white oil and 10-90% of one or more solvents selected from the group consisting of:

- (1) n-alkane (C12-C18);
- (2) methyl acetate;
- (3) t-butyl acetate;
- (4) benzotrifluoride;
- 10 (5) acetone;
- (6) parachlorobenzotrifluoride;
- (7) parachlorobenzotrifluoride;
- (8) perchloroethylene; and,
- (9) methylene chloride; and,
- 15 (10) a mixture of methylene chloride, acetone, t-butyl acetate, methyl acetate and perchloroethylene.

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(2) 18

17. The composition according to claim 18 wherein the solvent component, expressed in terms of % by total volume of the composition, consists essentially of 1-20% technical white oil and 10-90% of one or more of: methylene chloride; acetone; t-butyl acetate; methyl acetate; and, perchloroethylene.

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Sub 16 21. A resin-solvent composition for use as an adhesive comprising approximately:

10 40-90%, by total volume of the composition, of one or more of 1-bromopropane and benzotrifluoride, 5-35% of a hydrocarbon resin as a tackifier, and 5-25% of a resin, at least a portion of the resin being selected from the group of styrene-butadiene, polychloroprene, polyvinyl chloride, acrylic, epoxy, 15 urethane, nitrocellulose, and styrene.

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23 22. The composition according to claim 21 wherein at least a portion of the hydrocarbon resin is selected from the group of olefin, rosin ester and terpene.

24 23. A composition for use as a blowing agent in the manufacture of resin foams, the composition comprising approximately, by total weight of the composition:

5 50-70% polyether triol;

10 20-40% of one or more of toluene diisocyanate and toluene disocyanurate;

15 0-5% catalyst;

20 0-5% surfactant;

25 0-10% water; and,

30 2-15% of one or more of: 1-bromopropane; chlorobromomethane, ~~1,2 dichloro-1,1,1 trifluoroethane~~.

25 24. The composition according to claim 23 wherein: the polyether triol is present in the amount 60-65%;

5 the one or more of toluene diisocyanate and toluene disocyanurate is present in the amount of 30-33%; the water is present in the amount of 1-2%; the catalyst is present in the amount of 0.09-2%;

10 the surfactant is present in the amount of 0.3-1.5%; and,

the one or more of 1-bromopropane and chlorobromomethane is present in the amount of 2.4-6.1%.

26 25. A cleaning composition ^{consisting essentially of} having generally zero volatile organic compounds (VOCs), the composition consisting essentially of one or more of the zero-VOC solvents selected from the group consisting of:

5 chlorobromomethane;

1-bromopropane;

n-alkane (C12-C18);

t-buyl acetate;

perchloroethylene;

10 benzotrifluoride;

parachlorobenzotrifluoride;

acetone;

1,2-dichloro-1,1,2-trifluoroethane;

dimethoxymethane;

15 1,1,1,2,2,3,3,4,4-nonafluoro-4-methoxy-
butane;

2- (difluoromethoxymethyl) -1,1,1,2,3,3,3-
heptafluoropropane;

20 1 - ethoxy - 1 , 1 , 2 , 2 , 3 , 3 , 4 , 4 , 4 -
nonafluorobutane; and,
2- (ethoxydifluoromethyl) -1,1,1,2,3,3,3-
heptafluoropropane.

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27 26. The cleaning composition of claim 25 wherein the
one or more solvents, expressed in terms of total volume
of the composition, is selected from the group consisting
of:

5 (1) 10-90% benzotrifluoride and 10-90% of one or
more of the solvents:
(a) 1,1,1,2,2,3,3,4,4-nonafluoro-4-methoxy-
butane;
(b) 2- (difluoromethoxymethyl) -1,1,1,2,3,3,3-
heptafluoropropane;
(c) 1 - ethoxy - 1 , 1 , 2 , 2 , 3 , 3 , 4 , 4 , 4 -
nonafluorobutane;
(d) 2- (ethoxydifluoromethyl) -1,1,1,2,3,3,3-
heptafluoropropane;
10 (e) perchloroethylene;
(f) 1-bromopropane;
(g) acetone;
(h) n-alkane (C12-C16);
15 (i) t-buyl acetate (C12-C16); and,

20 (j) parachlorobenzotrifluoride;

(2) 5-20% benzotrifluoride and 80-95% 1-bromopropane;

(3) 10-90% acetone and 10-90% n-alkane (C12-C18);

(4) 10-90% 1-bromopropane and 10-90% of one or more of:

(a) chlorobromomethane; and,

(b) n-alkane (C12-C18);

(5) 10-90% parachlorobenzotrifluoride and 10-90% of one or more of:

(a) 1-bromopropane;

(b) chlorobromomethane;

(c) t-butyl acetate; and,

(d) n-alkane (C12-C18);

(6) 10-90% 1,2-dichloro-1,1,1-trifluoroethane and 10-90% of one or more of:

1,1,1,2,2,3,3,4,4-nonafluoro-4-methoxy-butane;

2-(difluoromethoxymethyl)-1,1,1,2,3,3,3-heptafluoropropane;

1-ethoxy-1,1,2,2,3,3,4,4,4-nonafluorobutane;

and,

2-(ethoxydifluoromethyl)-1,1,1,2,3,3,3-heptafluoropropane;

1-bromopropane

acetone;

45 benzotrifluoride; and,

methyl acetate.

Add
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